

- * HAVE HW OUT (Prob. Rules Review #1)
- * WARM UP: complete the worksheet, side 1

7.2- Two Way tables

Find the probability that a randomly selected student is:

Sex	Do you play an instrument?		
	Yes	No	Total
Male	15	26	41
Female	32	27	59
Total	47	53	100

- (a) A male.
 $P(M) = \frac{41}{100} = 0.41$
- (b) Plays an instrument.
 $P(Y) = \frac{47}{100} = 0.47$
- (c) A male and plays an instrument
 $P(M \cap Y) = \frac{15}{100}$
- (d) A male or plays an instrument.
 $P(M \cup Y) = \frac{73}{100}$
- (e) A female or plays an instrument.
 $P(F \cup Y) = \frac{74}{100}$

(f) A female and doesn't play an instrument.

$$P(F \cap N) = \frac{27}{100}$$

(g) A female GIVEN THAT they play an instrument.

$$P(F|Y) = \frac{32}{47} =$$

$$P(F|Y) = P(F)$$

(h) Plays an instrument GIVEN THAT they are male.

$$P(Y|M) = \frac{15}{41} = 0.366$$

(i) Are GENDER and PLAYING AN INSTRUMENT independent?

$$P(B|A) = P(B) \quad P(Y|M) \neq P(Y) \quad \text{NO}$$

(j) Are GENDER and PLAYING AN INSTRUMENT disjoint?

$$P(A \cap B) = 0? \quad P(F \cap N) \neq 0? \quad \text{NO}$$

Sex	Do you play an instrument?		
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(a) What is the probability of being a freshman?

$$P(F) = \frac{34}{162} = 0.2099$$

(b) What is the probability of having an "OTHER" pet?

$$P(O) = \frac{45}{162} = 0.278$$

(c) What is the probability of having a cat and being a junior?

$$P(C \cap J) = \frac{13}{162} = 0.0802$$

(d) What is the probability of being a senior and owning a dog?

$$P(Sr \cap D) = \frac{16}{162} = 0.0988$$

(e) What is the probability of being a sophomore OR having a cat?

$$P(So \cup C) = \frac{79}{162} = 0.4877$$

	Frosh	Soph	Junior	Senior	
Dog	14	18	22	16	70
Cat	8	11	13	15	47
Other	12	14	10	9	45
	34	43	45	40	162

(f) What is the probability of being a senior OR having a dog?

$$P(Sr \cup D) = \frac{94}{162}$$

(g) Given that someone is a sophomore, what is the probability they like Dogs the most?

$$P(D|So) = \frac{18}{43} =$$

(h) IF Given that someone likes Cats the most, what is the probability that they are a junior?

$$P(J|C) = \frac{13}{47} \quad P(J|C) = P(J)$$

(i) We pick a freshman at random. What is the probability that they like other the most?

$$P(O|F) = \frac{12}{34}$$

$$0.277 \neq$$

(j) Are pet preference and grade level independent?

$$P(O|F) = P(O) \quad 0.353 \neq 0.278 \quad \text{NO}$$

(k) Are pet preference and grade level disjoint?

$$\text{No. } P(C \cap J) \neq 0$$

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